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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/714,380

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Stephen M. Trimberger

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XILINX, INC

ATTN: LEGAL DEPARTMENT

2100 LOGIC DR

SAN JOSE, CA 95124

EXAMINER

MORAN, RANDAL D

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/714,380	Applicant(s) TRIMBERGER, STEPHEN M.	
	Examiner RANDAL D. MORAN	Art Unit 2135	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 1-20 and 22 are pending.

This Office Action in response to amendment filed 11/9/2007.

Below, Examiner has pointed out particular references contained in the prior art(s) of record in the body of this action for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claims, other passages and figures may apply as well. Applicant should consider the entire prior art as applicable as to the limitations of the claims. It is respectfully requested from the applicant, in preparing the response, to consider fully each reference in its entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior arts or disclosed by the examiner.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-18, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Pang et al. (US 6,981,153)**, hereafter "Pang" in view of **Lesea et al. (US 6,496,971)**, hereafter "Lesea".

Considering **Claim 1**, Burnham discloses a system of securely using decryption keys during Programmable Logic Device (PLD) configuration (column 2- lines 35-45), comprises: a key storage register coupled to the microcontroller for storing key data (Fig. 10A, column 15, lines 14-23, Lesea- column 4- lines 17-24); a decryptor coupled to the key storage register (Fig. 3- item 24), wherein only the decryptor can read from the key storage register (column 13- lines 37-56, column 16- lines 27-33, Fig. 8, Fig. 9); and a configuration data register in the PLD (Fig. 3, column 11- lines 44-56), wherein the configuration data register cannot be read by the microcontroller after the decryptor is used (column 14- lines 18-38).

Pang does not explicitly disclose a microcontroller within the PLD for receiving an encrypted bitstream.

Lesea discloses a microcontroller within the PLD for receiving an encrypted bitstream (column 4- lines 12-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Pang by a microcontroller within the PLD for receiving an encrypted bitstream as taught by Lesea in order to support multiple configuration modes (Lesea- column 2- lines 57-58).

Considering **Claim 2**, the combination discloses the microcontroller stores key data in the key storage register, but the microcontroller cannot read from the key storage register (Pang- column 15- lines 39-40 and 58-66, column 16- lines 27-33).

Considering **Claim 3**, the combination discloses the decryptor is a hardware decryptor embedded in an integrated circuit along with the PLD (Pang- column 13- lines 37-56, Fig. 3- item 24).

Considering **Claim 4**, the combination discloses the decryptor is a software decryptor stored in a memory and executed by the microcontroller (Pang- column 13- lines 37-56), wherein the system further comprises hardware that selectively enables access to the key storage register by allowing the microcontroller access when a program counter of the microcontroller specifies an address within an address range corresponding to the software decryptor within the memory (Lesea- column 40-53, Pang- column 20- lines 27-53, Fig. 16).

Considering **Claims 5, 10**, the combination discloses the memory is a ROM having a decryption engine (Lesea- column 3- lines 7-12, column 4– lines 17-25).

Considering **Claim 6**, the combination discloses the microcontroller further receives a configuration boot program comprising the decryptor in programmatic form along with the encrypted bitstream comprising encrypted configuration data to be loaded into the configuration data register (Lesea- column 8- lines 33-55, Pang- column 1- lines 31-38 and 52-58).

Considering **Claim 7**, the combination discloses the microcontroller, the key register, the decryptor, and the configuration data register are all within the PLD (Pang- Fig. 3).

Considering **Claim 8**, the combination discloses the microcontroller is an emulated microcontroller in the PLD (Pang- column 5- lines 47-64).

Considering **Claim 9**, the combination discloses a system of securely using decryption keys during configuration of an integrated circuit having programmable logic (Pang- abstract, column 2- lines 35-45), comprising: a microcontroller within the integrated circuit for receiving an encrypted bitstream (Lesea- column 4- lines 15-25, Pang- column 5- lines 47-64); a key storage register coupled to the microcontroller for storing key data (Pang- Fig. 10A, column 15, lines 14-23); a decryption program stored in a memory that uses a predetermined memory address to enable access to the key storage register (Pang- column 12- lines 36-47); and a configuration data register in the integrated circuit (Pang- Fig. 3, column 11- lines 44-56), wherein the configuration data register cannot be read by the microcontroller after the decryption program is used (Pang- column 11- lines 44-56, column 14- lines 18-38); wherein access to the key storage register by the microcontroller is allowed only when a program counter of the microcontroller specifies an address within an address range corresponding to the decryption program in the memory (Lesea- column 40-53, Pang- column 20- lines 27-53, Fig. 16).

Considering **Claim 11**, the combination discloses the microcontroller further receives a configuration boot program along with the encrypted bitstream (Lesea- column 8- lines 32-55).

Considering **Claim 12**, the combination discloses a method of securely using decryption keys during field programmable gate array configuration (Pang- abstract- column 2- lines 35-45), comprising the steps of: receiving an encrypted bitstream at a microcontroller within the field programmable gate array (Lesea- column 4- lines 15-25,

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Pang- column 5- lines 47-64); loading a decryptor with data from a key register (Pang- column 13- lines 37-55); loading the decryptor with data from the microcontroller (Pang- column 13- lines 37-56); and loading a configuration data register with a decrypted bitstream from the decryptor (Pang- column 14- lines 18-38), wherein the configuration data register cannot be read by the microcontroller after the decryptor is used (Pang- column 14- lines 18-38).

Considering **Claim 13**, the combination discloses the step of loading the key register with key data from the microcontroller (Pang- column 15- lines 39-40 and 58-66).

Considering **Claim 14**, the combination discloses the configuration data register cannot be read by the microcontroller while the decryptor is used (Pang- column 14- lines 18-33).

Considering **Claim 15**, the combination discloses the microcontroller cannot read from the key register (Pang- column 15- lines 39-40 and 58-66, column 16- lines 27-33).

Considering **Claim 16**, the combination discloses only the decryptor can read from the key storage register (Pang- column 13- lines 37-55, column 15- lines 59-66, column 16- lines 27-33).

Considering **Claim 17**, the combination discloses the steps of loading the decryptor with data from the key register and loading the decryptor with data from the microcontroller (Pang- column 13- lines 37-55) comprises selectively enabling access to the key register by allowing the microcontroller access only when a program counter of

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the microcontroller specifies an address within an address range of the decryptor (Lesea- column 6- lines 40-53).

Considering **Claim 18**, the combination discloses a system of securely using decryption keys during programmable logic device configuration (Pang- abstract, column 2- lines 35-45), comprises: a memory-mapped key register coupled to a microcontroller data bus (Pang- column 15- lines 14-23); a decryptor engine stored in non-volatile memory and coupled to the microcontroller data bus (Pang- column 13- lines 37-55); and logic circuitry limiting access to the key register from the microcontroller data bus using specified addresses of the non-volatile memory corresponding to the decryptor engine and a received program counter value of a microcontroller (Pang- column 20- lines 27-53, Lesea- column 6- lines 40-53).

Consdering **Claim 20**, the combination discloses a computer-readable usable medium comprising instructions written thereon in the form of a bitstream that configures a programmable logic device (Pang- abstract, column 2- lines 35-45), the computer- readable usable medium comprising: a configuration boot program portion of the bitstream that runs a microcontroller on the programmable logic device (Lesea- column 8- lines 32-55); and an encrypted bitstream portion of the bitstream containing encrypted configuration data that when decrypted and loaded into a configuration data register on the programmable logic device configures the programmable logic device (Lesea- column 8- lines 33-55, Pang- column 2- lines 35-45), wherein the configuration boot program further comprises instructions for a decryptor (Pang- column 13- lines 37-

56), wherein the configuration boot program stores the instructions for the decryptor Pang- column 2- lines 35-45).

Considering **Claim 22**, the discloses the configuration boot program comprises instructions for a decompressor (Lesea- column 2- lines 12-25, column 8- lines 15-20).

2. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Pang and Lesea** in view of **Kuranaga (US 5,409,661)**, hereafter “Kuranaga”.

Considering **Claim 19**, the combination does not explicitly disclose the logic circuitry uses specified addresses of the non-volatile memory by limiting access to minimum and maximum ROM memory addresses using the microcontroller program counter. The combination does suggest limiting access to ROM memory addresses using a program counter (Lesea- column 6- lines 40-53, Pang- column 16- lines 27-53). Kuranaga discloses the logic circuitry uses specified addresses of the non-volatile memory by limiting access to minimum and maximum ROM memory addresses using the microcontroller program counter (column 6- lines 56-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination by the logic circuitry uses specified addresses of the non-volatile memory by limiting access to minimum and maximum ROM memory addresses using the microcontroller program counter as taught by Kuranaga in order to facilitate the protection of designs loaded into a PLD through a bitstream (Pang- column 1- lines 6-7).

Response to Arguments

Applicant's arguments filed 6/13/2008 have been fully considered but they are not persuasive.

Regarding **Claim 1**, applicant's arguments have been fully considered but are not persuasive. With respect to applicants argument that the combination fails to teach *a key storage register coupled to the microcontroller for storing key data as well as a configuration data register in the PLD, wherein the configuration data register cannot be read by the microcontroller after the decryptor is used* since it is conceded within the office action that Pang does not explicitly disclose a microcontroller within the integrated circuit. The microcontroller is explicitly disclosed within Lesea, and the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

With respect to applicants argument that the combination fails to teach *a microcontroller that receives an encrypted bitstream*. Applicant is directed to Lesea- column 4- lines 12-25, Fig. 5. Lesea discloses "a processor, an on-chip oscillator, an amount of non-volatile memory, an amount of random access memory, decoding circuitry..." Applicant is further directed to Pang- Fig.3. Pang discloses a decryptor 24 in Fig. 3. Therefore, the combination o discloses a microcontroller that receives an encrypted data stream.

Regarding **Claim 4**, applicant's arguments have been fully considered but are not persuasive. With respect to applicants argument that the combination fails to teach *the decryptor is a software decryptor stored in a memory and executed by the microcontroller, wherein the system further comprises hardware that selectively enables access to the key storage register by allowing the microcontroller access when a program counter of the microcontroller specifies an address within an address range corresponding to the software decryptor within the memory* (Lesea- column 40-53, Pang- column 20- lines 27-53, Fig. 16). Applicant is directed to Pang- column 13- lines 37-56, column 20- lines 27-53, Fig. 16, Lesea- column 6- lines 40-53. Lesea discloses:

“If a digital high is present on the X address line of a configuration memory cell, and a digital high is present on the Y address line of the configuration memory cell, and a global enable line 107 is pulsed with a high pulse, then an AND gate 108 of the configuration memory cell outputs a digital high pulse thereby enabling an access transistor 109. If a frame buffer 110 drives a digital value onto a data line 111 of the configuration memory cell, then this digital value will be loaded into the configuration memory cell and will be stored by the latch. If frame buffer 110 is not output enabled, then latch 101 drives the stored configuration data through enabled access transistor 109 and onto data line 111. This data can then be read by processor 9 via a readback buffer 112.”

Therefore, the combination discloses allowing the microcontroller access when a program counter of the microcontroller specifies an address within an address range (i.e. the configuration memory cell outputs a high pulse thereby enabling an access transistor).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Randal D. Moran whose telephone number is 571-270-1255. The examiner can normally be reached on M-F: 7:00 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Vu can be reached on 571-272-3859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. D. M./
Examiner, Art Unit 2135

9/9/2008

/KimYen Vu/

Supervisory Patent Examiner, Art Unit 2135